ABSTRACT

Systems and methods are provided the autocentering, autofocusing, acquiring, decoding, aligning, analyzing and exchanging among various parties, images, where the images are of arrays of signals associated with ligand-receptor interactions, and more particularly, ligand-receptor interactions where a multitude of receptors are associated with microparticles or microbeads. The beads are encoded to indicate the identity of the receptor attached, and therefore, an assay image and a decoding image are aligned to effect the decoding. The images or data extracted from such images can be exchanged between de-centralized assay locations and a centralized location where the data are analyzed to indicate assay results. Access to data can be restricted to authorized parties in possession of certain coding information, so as to preserve confidentiality.